

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An electrochemical biosensor comprising:

(1) a hollow electrochemical cell for measuring a concentration of glucose in a blood sample, the hollow electrochemical cell comprising:

a) at least one non-metal working electrode;

b) at least one counter electrode or counter/reference electrode, wherein the working electrode and the counter electrode or counter/reference electrode face each other, are located on different planes not co-planar, and are separated by a distance of from about 20 microns to about 200 microns;

c) a spacer interposed between the working electrode and the counter electrode or counter/reference electrode, wherein the spacer comprises a non-conductive polymeric material, and wherein the hollow electrochemical cell has an effective cell volume of less than 1.5 microliters; and

(2) ~~means for measuring from cell current the diffusion coefficient of a redox mediator in the cell and independently its concentration.~~

circuitry configured to determine the diffusion coefficient of a redox mediator in the cell, and independently its concentration, from cell current.

2. (Previously Presented) The electrochemical biosensor of claim 1, wherein at least one non-metal working electrode comprises a material selected from the group consisting of graphite, carbon, and carbon-filled plastic.

3. (Previously Presented) The electrochemical biosensor of claim 2, wherein at least one counter electrode or counter/reference electrode comprises a metal substrate or a metal coated substrate.

4. (Previously Presented) The electrochemical biosensor of claim 3, wherein the metal is selected from the group consisting of gold, silver, platinum, palladium, iridium, lead, and alloys thereof.

5. (Previously Presented) The electrochemical biosensor of claim 4, wherein the metal comprises silver, and wherein the blood sample comprises chloride ions and a reduced form of a redox species or an oxidized form of a redox species.

6. (Previously Presented) The electrochemical biosensor of claim 1, wherein walls of the spacer and the electrodes define the effective cell volume of the hollow electrochemical cell.
7. (New) The electrochemical biosensor of claim 1, wherein the circuitry comprises a microprocessor.
8. (New) The electrochemical biosensor of claim 1, wherein the working electrode and the counter electrode or counter/reference electrode are planar electrodes.
9. (New) The electrochemical biosensor of claim 1, wherein the circuitry is configured to achieve a steady-state current.
10. (New) The electrochemical biosensor of claim 1, wherein the at least one counter electrode or counter/reference electrode is only a single electrode.
11. (New) The electrochemical biosensor of claim 1, wherein the circuitry is configured to maintain an approximately fixed potential to determine the diffusion coefficient and concentration of the redox mediator.